

# Robert Konik

CMPMS Department  
Building 734  
Brookhaven National Laboratory  
Upton, NY, USA 11973-5000

Citizenship: Canadian  
Work: (631)-344-3225  
E-mail: rmk@bnl.gov

---

## EDUCATION

<b>Ph.D.</b> Theoretical Physics, Cornell University, Ithaca NY.	September 1997
<b>B.Sc.</b> University of Calgary, Alberta, Canada, Physics and Pure Mathematics (honours with distinction).	June 1991

## PROFESSIONAL EMPLOYMENT

<b>Chair of CMPMS Division</b>	2016-
<b>Deputy Chair of CMPMS Division</b>	2015
<b>Physicist (2009)/Associate Physicist (2006)/ Assistant Physicist (2004)/Research Scientist (2003)</b> CMPMS Division, Brookhaven National Laboratory	September 2003 - present time
<b>Research Scientist (2001)/Research Associate</b> Department of Physics, University of Virginia.	September 1999 - August 2003
<b>NSERC Postdoctoral Fellow</b> Department of Physics/Institute for Theoretical Physics, University of California, Santa Barbara.	October 1997 - September 1999
<b>NSERC Fellow and Graduate Research Assistant</b> Newman Laboratory, Department of Physics, Cornell University.	February 1993 - September 1997
<b>Consultant and Research Assistant</b> AT&T Bell Laboratories (Murray Hill).	Various periods during 1988-1995

## VISITING POSITIONS

<b>Visiting Scientist</b> London Centre for Nanotechnology	2015-2019
<b>Visiting Scientist</b> Universiteit van Amsterdam, Amsterdam, the Netherlands	February 2009, 2010
<b>Visiting Professor</b> Université de Cergy-Pontoise, Paris, France	May 2008
<b>INSTANS Visiting Scientist</b> Universiteit van Amsterdam, Amsterdam, the Netherlands	February-March 2008

## EDITORIAL SERVICE

### Associate Editor

Physical Review B

2008-present

### Referee

Physical Review Letters

Physical Review B

Nuclear Physics B

New Journal of Physics

Europhysics Letters

Journal of Statistical Mechanics

Basic Energy Sciences Division of the Department of Energy

National Science Foundation

## CONFERENCES/WORKSHOPS/SCHOOLS ORGANIZED

**Integrability in atomic and condensed matter physics**, École de Physique des Houches, August 2018.

**Beyond Integrability: The Mathematics and Physics of Integrability and its Breaking in Low Dimensional Strongly Correlated Quantum Phenomena**, Montreal, 2015.

**Emergent Phenomena in the Dynamics of Quantum Matter: Disorder, quenches, simulations, and experiment**, New York, 2014.

**Frontiers of quantum condensed matter physics: light, matter and unusual devices out of equilibrium**, New York, 2013.

**Workshop on Strong Correlations in the Cuprates**, Montauk NY 2012.

**Frontiers of quantum condensed matter physics: light, matter and unusual devices out of equilibrium**, New York, 2012.

**Workshop on Quantum Quenches and Strongly Correlated Physics**, Montauk NY 2011.

**Workshop on Strong Fluctuations in Low Dimensions**, Montauk NY 2008.

**Workshop on Strong Correlations in Low Dimensional Transport and Dynamics**, Montauk NY 2007.

**Workshop on Frustrated Magnetism**, Montauk NY 2004.

## INVITED TALKS AND COLLOQUIA

**Studies of the Loschmidt Echo and Entanglement Spreading in Two Dimensional Arrays of Coupled Ising Chains**, Entanglement and Dynamical Systems Program, Simons Center, Stony Brook University, November 2016.

**Modeling Pump-Probe Phenomena in Strongly Correlated Systems in Two Dimensions: Combining Matrix Product States and Exact Solvability**, CONES 2016: Fluctuations, Rare Events and Non-Stationary Dynamics, London, July 2016.

**Modeling Pump-Probe Phenomena in Strongly Correlated Systems in Two Dimensions: Combining Matrix Product States and Exact Solvability**, Condensed Matter Physics in the City, Rutherford Lab July 2016.

**Studies of the Loschmidt Echo in Two Dimensional Quantum Ising and Arrays of Luttinger Liquids**, UK Meeting on Integrable and Conformal Field Theory, Kings College London, June 2016.

**Overview of the Truncated Conformal Spectrum Approach**, Galileo Galilei Institute, Workshop on the Conformal Bootstrap, June 2016.

**Interactions and Topological Insulators Through the Prism of Spin Chains**, London Centre for Nanotechnology, February 2016.

**Quantum Stutter and Arrested Expansion in Two-Component Bose Gases**, Kings College, February 2016.

**Series of Lectures on the Truncated Conformal Spectrum Approach**, Winter School on Statistical Field Theory, Florence, February 2016.

**Studies of the Loschmidt Echo in Two Dimensional Coupled Arrays of Quantum Ising Chains and Luttinger Liquids**, Isaac Newton Institute Workshop on Quantum Integrable Models in and out of Equilibrium, January 2016.

**Quantum Stutter and Arrested Expansion in Two-Component Bose Gases**, SISSA, Workshop on Statistical Field Theory, October 2015.

**Quantum Stutter and Arrested Expansion in Two-Component Bose Gases**, Stony Brook University, September 2015.

**Quantum Stutter and Arrested Expansion in Two-Component Bose Gases**, Amsterdam, July 2015.

**Quantum Stutter and Arrested Expansion in Two-Component Bose Gases**, University of College London, May 2015.

**Glimmers of a Quantum KAM Theorem: Insights from Quantum Quenches in One Dimensional Bose Gases**, SISSA, November 2014.

**Glimmers of a Quantum KAM Theorem: Insights from Quantum Quenches in One Dimensional Bose Gases**, Institute of Physics, Budapest Univ. Technology and Economics, November 2014.

**Glimmers of a Quantum KAM Theorem: Insights from Quantum Quenches in One Dimensional Bose Gases**, London Center for NanoScience, October 2014.

**Glimmers of a Quantum KAM Theorem: Insights from Quantum Quenches in One Dimensional Bose Gases**, Columbia University, October 2014.

**Glimmers of a Quantum KAM Theorem: Insights from Quantum Quenches in One Dimensional Bose Gases**, Conference on Field Theory Methods in Low-Dimensional Strongly Correlated Quantum Systems, Trieste, Italy, August 26-August 30, 2014.

**Glimmers of a Quantum KAM Theorem: Insights from Quantum Quenches in One Dimensional Bose Gases**, The Nordita Conference on Quantum Engineering of States and Devices, Stockholm, Sweden, August 18-August 22, 2014.

**Glimmers of a Quantum KAM Theorem: Insights from Quantum Quenches in One Dimensional Bose Gases at "Quantum Manybody Dynamics**, Conference at the Perimeter Institute in Waterloo, Canada, May 12-May 16, 2014.

**Glimmers of a Quantum KAM Theorem: Insights from Quantum Quenches in One Dimensional Bose Gases**, Quantum Integrability, Conformal Field Theory and Topological Quantum Computation" conference in Natal, Brazil, March 31-April 4, 2014.

**Post-quench Dynamics in Lieb-Liniger: Glimmers of Quantum KAM**, Max Planck Institute for the Physics of Complex Systems, Dresden August 29, 2013.

**Using a Numerical RG to Study Perturbed Integrable Systems**, Max Planck Institute for the Physics of Complex Systems, Dresden August 28, 2013

**Non-Equilibrium Behavior and Thermalization in 1D Bose Gases**, Institute for Theory of Statistical Physics RWTH Aachen July 18, 2013.

**Understand Entanglement in 2+1D Systems through Arrays of Coupled 1+1D Field Theories**, University of Amsterdam, May 22 2013.

**Understand Entanglement in 2+1D Systems through Arrays of Coupled 1+1D Field Theories**, Kings College, London, May 17 2013.

**Non-Equilibrium Behavior and Thermalization in 1D Bose Gases**, Oxford, May 2013.

**Non-equilibrium behavior of 1D Bose Gases**, presented at the CUNY Graduate Center, November 2012.

**Non-equilibrium behavior of 1D Bose Gases** as part of workshop *Dynamic and Thermodynamics in Isolated Quantum Systems* at the KITP, UCSB, September 2012.

**Non-equilibrium behavior of 1D Bose Gases** as part of workshop *Workshop on Quantum Simulations with Ultracold Atoms* at the ICTP in Trieste, Italy, July 2012.

**Entanglement Entropy and Spectra in Two Dimensional Arrays of Coupled Chains** at the Galileo Galilei Institute in Firenze, Italy as part of workshop *New quantum states of matter in and out of equilibrium*, May 2012.

**Thermalization in Integrable and Non-Integrable Systems**, University of Amsterdam, February 2012.

**Exciton Hierarchies in Semiconducting Carbon Nanotubes** presented at SISSA, Trieste, Italy, December 2011.

**Understanding Quantum Quenches through a Numerical Renormalization Group**, as part of the workshop entitled *Quantum Quenches and Strongly Correlated Phenomena* Montauk, NY, September 2011.

**Understanding Quantum Quenches through a Numerical Renormalization Group**, as part of the *Workshop on Integrability and its Breaking in Strongly Correlated and Disordered Systems*, ICTP, Trieste, Italy, May 2011.

**Quench Dynamics in Trapped 1-D Bose Gases**, Universiteit van Amsterdam, May 10, 2011

**Exciton Hierarchies in Gapped Carbon Nanotubes**, Boston College, April 30, 2011.

**Excitonic Hierarchies in Gapped Carbon Nanotubes** presented at Nordita, Stockholm, Sweden, September 2010.

**The Finite Temperature Behaviour of Quantum Spin Chains** colloquium presented at the Universiteit van Amsterdam, Amsterdam, the Netherlands, February 2010.

**Ferromagnetism vs. Antiferromagnetism in Double Quantum Dots: Results from the Bethe Ansatz** presented at the Universiteit van Amsterdam, Amsterdam, the Netherlands, February 2010.

**The Numerical Renormalization Group Approach to Strongly Correlated Systems** presented at the Universiteit van Amsterdam, Amsterdam, the Netherlands, February 2009.

**Ferromagnetism vs. Antiferromagnetism in Double Quantum Dots: Results from the Bethe Ansatz** presented at the GGI Workshop in Low Dimensional Field Theories and Application, Florence, Italy, October 2008.

**From Carbon Nanotubes to Atomic Bose Gases: A Numerical Renormalization Group Approach to Strongly Correlated Systems** presented at the 2nd INSTANS Conference, Florence, Italy, September, 2008.

**Low Temperature Dynamical Correlation Functions in Gapped Quantum Spin Chains** presented at Laboratoire de Mathématiques et Physique Théorique de l'Université de Tours, May 2008.

**Low Temperature Dynamical Correlation Functions in Gapped Quantum Spin Chains** presented at the Université de Cergy-Pontoise, May 2008.

**A Numerical Renormalization Group Approach to Strongly Correlated Systems** presented at the Institute for Theoretical Physics, Universiteit van Amsterdam, February 2008.

**Numerical Renormalization Group Approach to Strongly Correlated Systems: Study of Semiconducting Carbon Nanotubes** presented at Cavendish Laboratory, Cambridge University, United Kingdom, December 2007.

**A Numerical Renormalization Group Approach to Strongly Correlated Two and Three Dimensional Electron Problems** presented at the Workshop on Highly Frustrated Magnets and Strongly Correlated Systems, ICTP, Trieste, Italy, August 2007.

**A Numerical Renormalization Group Approach to Strongly Correlated Two and Three Dimensional Electron Problems** presented at the Workshop on Low Dimensional Quantum Condensed Matter, Amsterdam, July 2007.

**A Numerical Renormalization Group Approach to Strongly Correlated Two and Three Dimensional Electron Problems** presented at the Canadian Association of Physicists Meeting, Saskatoon, June 2007.

**A Numerical Renormalization Group Approach to Strongly Correlated Electron Problems** presented at the Workshop on the Fundamental of Electronic Nanosystems, St. Petersburg, July 2006.

**A Numerical Renormalization Group Approach to Strongly Correlated Electron Problems** presented at the INSTANS Summer Conference on Interdisciplinary Statistical and Field Theory Approaches to Nanophysics and Low-dimensional Systems, Como, Italy, June 2006.

**Kondo Physics in Double Quantum Dots** presented at Yale University, March 2006.

**The Integrability of Multidot Systems** presented at the Workshop on Low Dimensional Quantum Condensed Matter, Amsterdam, July 2005.

**The Integrability of Multidot Systems** presented at the Workshop on the Fundamental of Electronic Nanosystems, St. Petersburg, June 2005.

**Kondo Physics in Double Quantum Dots** presented at University of Berkeley, March 2005.

**Kondo Physics in Double Quantum Dots** presented at Oxford University, July 2004.

**The Non-Perturbative Physics of Quantum Dots** presented at Purdue University, March 2004.

**The Non-Perturbative Structure of Fano Resonances in Quantum Dots** presented at the International Workshop on Field Theory Methods in Strongly Correlated Nanoscale Systems held Brookhaven National Laboratory, Upton, NY, August 2003.

**The Non-Perturbative Role of Topology in Quantum Dots** presented at Oxford University, United Kingdom, June 2003.

**The Physics of Strongly Interacting Nanoscale Systems**, presented at the Institute for Theoretical Physics, University of Hannover, Germany, June 2002.

**Novel Kondo Physics in Quantum Dots**, presented at Boston University, May 2002.

**Novel Kondo Physics in Quantum Dots**, presented at Rutgers University, May 2002.

**The Physics of Quantum Dots**, presented at the University of California, Irvine, February 2002.

**Strongly Correlated Physics in Nanoscale Systems**, presented at the California Institute of Technology, March 2001.

**Transport in Quantum Dots**, presented at the University of California, Santa Barbara, March 2001.

**Strongly Correlated Physics in Nanoscale Systems**, colloquium presented at the University of Toronto, March 2001.

**Ballistic Transport in Haldane Gapped Spin Chains**, presented at the University of Toronto, March 2001.

**The Physics of Mesoscopic Systems**, presented at the University of Minnesota, January 2001.

**Transport Properties in Quantum Dots**, presented at the Conference for Integrable Models in Condensed Matter Physics at the CRM, Université de Montréal, June 2000.

A lecture series presented at the Asian Pacific Centre for Theoretical Physics in Seoul, South Korea, May 1999:

- i) **Overview of Hubbard Ladders and Carbon Nanotubes**
- ii) **Exact Results in Hubbard Ladders and Carbon Nanotubes**
- iii) **Understanding Doped Hubbard Ladders and Carbon Nanotubes**

**Strongly Correlated Physics in Hubbard Ladders and Carbon Nanotubes**, presented at Princeton University, March 1999.

**Strongly Correlated Physics in Hubbard Ladders and Carbon Nanotubes**, presented at Brandeis University, March 1999.

**Two-Leg Hubbard Ladders and Carbon Nanotubes from Integrability**, presented at the Conference on Statistical Field Theory, International Centre for Theoretical Physics, Trieste, Italy, June 1998.

**Purely Transmitting Defect Field Theories**, presented at Princeton University, May 1997.

**Impurities in Optical Fibers**, colloquium presented at University of Miami, March 1997.

**The Integrability of Defect Field Theories**, presented at University of Miami, March 1997.